REMARKS

Claims 1-29 and 31-36 are pending in this application. By this Amendment, the drawings are replaced pursuant to the attached drawing sheets, claim 30 is cancelled without prejudice to or disclaimer of the subject matter contained therein, and claims 1-8, 13, 21-23 and 34-36 are amended. Claims 1, 2, 21, 23, 35 and 36 are amended to recite features supported in the specification, for example, at paragraphs [**0096**] – [**0098**] and Figs. 4-5. No new matter is added by any of these amendments.

Applicant gratefully acknowledges that claim 33 is allowed, and that claims 9, 10, 13-26 and 34 contain allowable subject matter. However, Applicant asserts that all of claims 1-8, 11, 12, 27-29, 31, 32 and 35 are allowable for the reasons discussed below.

Reconsideration based on the following remarks is respectfully requested.

I. References are Properly Disclosed

An Information Disclosure Statement along with form PTO-1449 is attached to this Amendment. The Information Disclosure Statement submits references cited in a foreign office action for the Examiner's consideration and formally making these references of record.

II. The Claims Satisfy All Formal Requirements

The Office Action objects to claims 30 and 34 based on informalities. Claim 30 has been cancelled and claim 34 has been amended to obviate the objection. Withdrawal of the claim objection is respectfully requested.

III. Claim 36 Defines Statutory Subject Matter

The Office Action rejects claim 36 under 35 U.S.C. §101 as being drawn to non-statutory subject matter. This rejection is respectfully traversed.

The "carrier wave signal" represents statutory subject matter as set forth in the *Training Materials* for Examiners. See *Examination Guidelines for Computer Related Inventions* under claim 13 in the Automated Manufacturing Plant example. Reviewed as a

whole, and given its broadest reasonable interpretation claim 36 is limited to a specific article of manufacture as a carrier wave. Thus, claim 36 is a statutory article of manufacture claim. Withdrawal of the rejection under 35 U.S.C. §101 is respectfully requested.

IV. Claims 1-8, 11, 12, 27-29, 31, 32 and 35 Define Patentable Subject Matter

The Office Action rejects claims 1, 2, 8, 11, 12, 27, 28, 31, 32 and 35 under 35 U.S.C. §102(b) over U.S. Patent 6,067,367 to Nakajima *et al.* (hereinafter "Nakajima"). This rejection is respectfully traversed.

Nakajima does not teach or suggest a method for determining a location of a peak of a correlation function generated by comparing a first high-spatial-frequency image to a second high-spatial-frequency image, the correlation function having a regular background portion and a peak portion, the method comprising determining a set of sparsely distributed correlation function value points based on comparing the first high frequency image to the second high frequency image at a plurality of sparsely-located offset positions to determine a plurality of corresponding sparsely distributed correlation function values; and identifying at least one correlation function value point that lies within the peak portion based on comparing at least one value characterizing the regular background portion of the correlation function to at least one of a) at least one correlation function value of the set of sparsely distributed correlation function value points and b) a determined value based on at least two of the correlation function value points, as recited in claim 1. These reasons apply by extension to claims 2, 8, 11, 12, 27, 28, 31 and 32 based on their dependence from claim 1.

Also, Nakajima fails to teach or suggest a recording medium that stores a control program, the control program executable on a computing device usable to receive data corresponding to a first high-spatial-frequency image and a second high-spatial-frequency image suitable for determining a correlation function having a regular background portion and a peak portion, the control program including instructions comprising instructions for determining a set of sparsely distributed correlation function value points, based on

comparing a first high-spatial-frequency image to a second high-spatial-frequency image at a plurality of sparsely-located offset positions to determine a plurality of corresponding sparsely distributed correlation function values; and instructions for identifying at least one correlation function value point that lies within the peak portion based on comparing at least one value characterizing the regular background portion of the correlation function to at least one of a) at least one correlation function value of the set of sparsely distributed correlation function value points and b) a determined value based on at least two of the correlation function values of the set of sparsely distributed correlation function value points, as recited in claim 35.

For example, regarding sparsely-located offset positions, the specification discloses various exemplary aspects of a displaced image (310) compared to a reference image (300) shown in Fig. 4 within a field of N rows and M columns of pixels. The displaced image (310) is compared to the reference image (300) at an offset position of a current pixel column (332-2). In a previous comparison, the offset position for the displaced image (310) corresponded to a previous pixel column (332-1) spaced apart from the current pixel column (332-2) by one or more skipped columns (332). Similarly, the next comparison of the displaced image (310) to the reference image (300) would occur at a next column (332-3) spaced apart from the current pixel column (332-2) by one or more skipped columns (332). For sparsely-located offset positions, the rows of the displaced image are compared to the corresponding rows of the reference image to produce a correlation value. A sparse series of such correlation values form a set of correlation function value points (402) shown in Fig. 5 plotted as a function of displacement.

The Office Action asserts (page 3) that Nakajima discloses "comparing a first high-spatial-frequency image to a second high-spatial-frequency image to determine at least one correlation function value for a set of at least one sparsely distributed correlation function value point of the correlation function." Applicant respectfully disagrees.

Instead, Nakajima discloses a tracking apparatus to measure moving direction. In particular, Nakajima teaches a CCD camera 10 and a control unit 20 with a CPU control section 20-1 and a Fourier transform section 20-7 that performs transformation on collated image data from the camera (col. 12, lines 3-32 and Fig. 2 of Nakajima). The control section 20-1 synthesizes the collation Fourier image data from step 107 with the registration Fourier image data in step 108. Nakajima teaches performing a two-dimensional discrete Fourier transform for the synthesized Fourier image data at step 111 from which to extract a correlation peak at step 112 and coordinates of the extracted peak at step 113 (col. 14, lines 20-27 and Fig. 3 of Nakajima).

Nakajima teaches that the control section 20-1 "scans the intensities (amplitudes) of the correlation components of the respective pixels... from this synthesized Fourier image data to obtain a histogram of the intensities of the correlation component of the respective pixels... [and] then extracts a pixel (correlation peak) having the highest intensity among the correlation components... from this histogram (step 112)..." (col. 13, lines 44-55 and Fig. 3 of Nakajima). Thus, contrary to the Office Action assertion, Nakajima performs correlation at the pixel level, not at the sparsely distributed level. In particular, Nakajima fails to teach or suggest determining sparsely distributed correlation function value points, as provided in Applicant's claimed features.

A claim must be literally disclosed for a proper rejection under §102. This requirement is satisfied "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" (MPEP §2131). Applicant asserts that the Office Action fails to satisfy this requirement with Nakajima.

The Office Action further rejects claims 3-7 under 35 U.S.C. §103(a) over Nakajima in view of U.S. Patent 6,754,367 to Ito *et al.* (hereinafter "Ito"); and claims 29 and 30 under 35 U.S.C. §103(a) over Nakajima in view of U.S. Patent 6,683,984 to Simske *et al.*

(hereinafter "Simske"). These rejections are rendered moot with respect to claim 30, and are respectfully traversed with respect to the remaining claims.

Ito does not compensate for the deficiencies of Nakajima outlined above for claim 1. Nor does Ito teach, disclose or suggest the additional features recited in claims 3-7. Instead, Ito discloses a method to detect an intruding object. In particular, Ito teaches detecting an object image 611 within an image 601 from a background 602 using a subtractor 605 (col. 4, lines 1-20 and Fig. 6 of Ito).

Simske does not compensate for the deficiencies of Nakajima outlined above for claim 1. Nor does Simske teach, disclose or suggest the additional features recited in claims 29 and 30. Instead, Simske discloses a method to store and extract background features. In particular, Simske teaches extracting edges from an image using an edge detection algorithm that require little memory for storage (col. 3, lines 63-67, col. 4, lines 33-40 of Simske).

Further, there is no motivation to combine features related to the transformed pixel correlation of Nakajima with the subtractor between object and background of Ito or the edge extracting technique of Simske, nor has the Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicant's claimed features.

A *prima facie* case of obviousness for a §103 rejection requires satisfaction of three basic criteria: there must be some suggestion or motivation either in the references or knowledge generally available to modify the references or combine reference teachings, a reasonable expectation of success, and the references must teach or suggest all the claim limitations (MPEP §706.02(j)). Applicant asserts that the Office Action fails to satisfy these requirements with Nakajima, Ito and/or Simske.

For at least these reasons, Applicant respectfully asserts that the independent claims are now patentable over the applied reference. The dependent claims are likewise patentable

over the applied references for at least the reasons discussed, as well as for the additional features they recite. Consequently, all the claims are in condition for allowance. Thus, Applicant respectfully requests that the rejections under 35 U.S.C. §§102 and 103 be withdrawn.

V. Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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JAO:GWT/gwt

Attachments:
Petition for Extension of Time
Replacement Drawing Sheets (Figs. 1-19)
Information Disclosure Statement with PTO-1449

Date: May 13, 2005

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Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

Amendments to the Drawings:

The attached sheets of drawings replace the original sheets including Figs. 1-19.

Attachment: Replacement Sheets: Figs. 1-19